

IN THE CLAIMS:

Amendments to the Claims

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-22 (canceled) (original patent claims which were inadvertently cancelled)

23. (previously presented) A liquid crystal display apparatus comprising:  
a pair of substrates, at least one of which is transparent;  
a liquid crystal layer formed by sandwiching a liquid crystal composition  
between said pair of substrates;  
a display region having a plurality of first semiconductor elements which are  
arranged in a matrix on one substrate of said pair of substrates;  
at least one peripheral circuit having a plurality of second semiconductor  
elements arranged at a periphery of said display region, said at least one peripheral  
circuit being formed on said one substrate of said pair of substrates and at least one  
part of said at least one peripheral circuit being arranged in a peripheral circuit region  
which is held between said pair of substrates; and  
at least one driver circuit which is electrically connected to said at least one  
peripheral circuit for driving said at least one peripheral circuit being arranged  
outside of a region which is held between said pair of substrates.

24. (currently amended) A liquid crystal display apparatus according to claim 23, wherein said at least one driver circuit is made of a separate member from said pair of substrates.

25. (previously presented) A liquid crystal display apparatus according to claim 23, wherein said display region having said plurality of first semiconductor elements has at least one semiconductor portion annealed by laser irradiation.

26. (previously presented) A liquid crystal display apparatus according to claim 23, wherein an amplitude of a liquid crystal driving source voltage of said at least one driver circuit is no greater than about 5V.

27. (previously presented) A liquid crystal display apparatus according to claim 26, wherein said at least one peripheral circuit includes said plurality of second semiconductor elements having at least one semiconductor portion annealed by laser irradiation.

28. (previously presented) A liquid crystal display apparatus according to claim 27, wherein the laser irradiation is provided by an excimer laser.

29. (previously presented) A liquid crystal display apparatus according to claim 28, wherein said at least one driver circuit is a single driver circuit.

30. (previously presented) A liquid crystal display apparatus according to claim 28, wherein said at least one driver circuit includes two driver circuits.

31. (previously presented) A liquid crystal display apparatus according to claim 28, wherein said plurality of second semiconductor elements are thin-film transistors, and said thin-film transistors have a mobility in the range of  $100 \text{ cm}^2/\text{Vs}$  to  $300 \text{ cm}^2/\text{Vs}$ .

32. (previously presented) A liquid crystal display apparatus comprising:  
a pair of substrates, at least one of which is transparent;  
a liquid crystal layer formed by sandwiching a liquid crystal composition between said pair of substrates;  
a display region having a plurality of semiconductor elements arranged in a matrix on one substrate of said pair of substrates;  
an image signal peripheral circuit which comprises a switch matrix circuit connected to said display region on one substrate of said pair of substrates; and  
at least one driver circuit electrically connected to said image signal peripheral circuit.

33. (previously presented) A liquid crystal display apparatus according to claim 32, wherein a scanning signal peripheral circuit is connected to said display region and is formed on one substrate of said pair of substrates.

34. (previously presented) A liquid crystal display apparatus according to claim 33, wherein at least one of said image signal peripheral circuit and said scanning signal peripheral circuit includes a plurality of semiconductor elements having at least one semiconductor portion annealed by laser irradiation.

35. (previously presented) A liquid crystal display apparatus according to claim 34, wherein the laser irradiation is excimer laser irradiation.

36. (previously presented) A liquid crystal display apparatus according to claim 35, wherein the laser irradiation is provided by an XeCl excimer laser.

37. (previously presented) A liquid crystal display apparatus according to claim 36, wherein said switch matrix circuit comprises thin-film transistors, and said thin-film transistors have a mobility in the range of  $100 \text{ cm}^2/\text{Vs}$  to  $300 \text{ cm}^2/\text{Vs}$ .

38. (previously presented) A liquid crystal display apparatus comprising:  
a pair of substrates, at least one of which is transparent;  
a liquid crystal layer formed by enclosing a liquid crystal composition between said pair of substrates;

a display region having a plurality of semiconductor elements arranged in a matrix form on one substrate of said pair of substrates;

at least one image signal peripheral circuit having a switch matrix circuit connected to said display region; and

at least one driver circuit, including at least one display information generating circuit, electrically connected to said at least one image signal peripheral circuit.

39. (previously presented) A liquid crystal display apparatus according to claim 38, wherein said at least one image signal peripheral circuit includes a plurality of semiconductor elements having at least one semiconductor portion annealed by laser irradiation.

40. (previously presented) A liquid crystal display apparatus according to claim 39, wherein the laser irradiation is provided by an excimer laser.

41. (previously presented) A liquid crystal display apparatus according to claim 40, wherein said excimer laser is a XeCl excimer laser.

42. (previously presented) A liquid crystal display apparatus comprising:  
a pair of substrates, at least one of which is transparent;  
a liquid crystal layer formed by sandwiching a liquid crystal composition between said pair of substrates;  
a display region having a plurality of first semiconductor elements arranged in a matrix form on one substrate of said pair of substrates; and  
an image signal peripheral circuit having a switch matrix circuit connected to said display region;  
wherein only one driver circuit is electrically connected to said image signal peripheral circuit for generating clock pulses and image signals.

43. (previously presented) A liquid crystal display apparatus according to claim 42, wherein said image signal peripheral circuit includes a plurality of semiconductor elements having at least one semiconductor portion annealed by laser irradiation.

44. (previously presented) A liquid crystal display apparatus according to claim 43, wherein the laser irradiation is provided by an excimer laser.

45. (previously presented) A liquid crystal display apparatus according to claim 44, wherein said excimer laser is a XeCl excimer laser.

46. (canceled)

47. (previously presented) A liquid crystal display apparatus according to claim 26, wherein the amplitude of the liquid crystal driving source voltage of said at least one driver circuit is no greater than about 3V.

(48-69 - corresponding to original patent claims 1-22 which were inadvertently cancelled)

48. (new) A liquid crystal display apparatus, comprising:  
a pair of substrates, at least one of which is transparent;

a liquid crystal layer formed by enclosing a liquid crystal composition between said pair of substrates;

a display region having a plurality of first semiconductor elements which are arranged in a matrix on one substrate of said pair of substrates;

peripheral circuits having a plurality of second semiconductor elements for driving said plurality of first semiconductor elements, arranged at a periphery of said display region, said peripheral circuits are formed on said one substrate of said pair of substrates and at least a part of said peripheral circuit are arranged in a peripheral circuits region which is held between said pair of substrates; and

at least one driver circuit which is an integrated circuit for driving said peripheral circuits is formed on said one substrate of said pair of substrates in a driver integrated circuit region which is not held between said pair of substrates.

49. (new) A liquid crystal display apparatus as claimed in claim 69, wherein said first and second semiconductor elements are thin film transistors.

50. (new) A liquid crystal display apparatus as claimed in claim 49, wherein

said thin film transistors at the display region have a mobility in a range of 1  $\text{cm}^2/\text{Vs}$  to 5  $\text{cm}^2/\text{Vs}$ ;

said thin film transistors at the peripheral circuits region have a mobility in a range from 10  $\text{cm}^2/\text{Vs}$  to 30  $\text{cm}^2/\text{Vs}$ ; and

the amplitude of a liquid crystal driving voltage of the driver circuit is at most 5 V.

51. (new) A liquid crystal display apparatus as claimed in claim 49,  
wherein  
said thin film transistors at the display region have a mobility in a range of 0.7  
 $\text{cm}^2/\text{Vs}$  to 5  $\text{cm}^2/\text{Vs}$ ;  
said thin film transistors at the peripheral circuits region have a mobility in a  
range from 30  $\text{cm}^2/\text{Vs}$  to 100  $\text{cm}^2/\text{Vs}$ ; and  
the amplitude of a liquid crystal driving voltage of the driver circuit is at most 5  
V.

52. (new) A liquid crystal display apparatus as claimed in claim 49,  
wherein  
said thin film transistors at the display region have a mobility in a range of 0.4  
 $\text{cm}^2/\text{Vs}$  to 5  $\text{cm}^2/\text{Vs}$ ;  
said thin film transistors at the peripheral circuits region have a mobility in a  
range from 100  $\text{cm}^2/\text{Vs}$  to 300  $\text{cm}^2/\text{Vs}$ ;  
the amplitude of a liquid crystal driving voltage of the driver circuit is at most 5  
V; and  
a softening point of said one substrate of said pair of substrates is at most  
600°C.

53. (new) A liquid crystal display apparatus as claimed in claim 49, wherein  
the thin film transistors at said display region have a switching time in a range  
from 30  $\mu\text{s}$  to 60  $\mu\text{s}$ ;



the thin film transistors at said peripheral circuit region have a switching time in a range of 3  $\mu$ s to 12  $\mu$ s; and

said driver circuit has a transistor having a switching time in a range from 0.01  $\mu$ s to 0.03  $\mu$ s.

54. (new) A liquid crystal display apparatus as claimed in either of claim 48 or claim 49, wherein

said driver is bonded directly to said one substrate of said pair of substrates.

55. (new) A liquid crystal display apparatus as claimed in claim 48, wherein

said pair of substrates are made of glass.

56. (new) A liquid crystal display apparatus as claimed in claim 55, wherein

said driver is bonded to said one substrate of said pair of substrates by a COG (chip on glass) method.

57. (new) A liquid crystal display apparatus as claimed in claim 48, wherein

the number of driver circuits bonded to said one substrate of said pair of substrates is one.

58. (new) A liquid crystal display apparatus as claimed in claim 48, wherein

said peripheral circuits region comprises:

a signal circuit at an image signal side of said display region for supplying an image signal to said plural first semiconductor elements arranged in said display region; and

a signal circuit at a scan signal side of said display region for supplying a scan signal to said plural first semiconductor elements.

59. (new) A liquid crystal display apparatus as claimed in claim 58, wherein

the number of driver circuits bonded to said other substrate of said pair of substrates is two, and

respective ones of said driver circuits are arranged adjacent to said signal circuit at said image signal side and at said scan signal side of said display region, respectively.

60. (new) A liquid crystal display apparatus as claimed in claim 48, wherein

the diagonal length of said display region is in a range from 75 mm to 175 mm; and

the distance from the outer periphery of the display region to the outer periphery of the liquid crystal display apparatus is at most 5 mm.

61. (new) A liquid crystal display apparatus as claimed in claim 48, wherein

the ratio of the area of said display region to the area of said one substrate of said pair of substrates is in a range from 70% to 95%.

62. (new) A liquid crystal display apparatus as claimed in claim 48,  
wherein

the distance between said driver circuit and said peripheral circuit region is at most 1 mm.

63. (new) A liquid crystal display apparatus as claimed in claim 48,  
wherein

a light-shield film is formed on said peripheral circuit region.

64. (new) A liquid crystal display apparatus as claimed in claim 48,  
wherein

a driver circuit is provided at only a short side of said one substrate of said pair of substrates.

65. (new) A liquid crystal display apparatus as claimed in claim 48,  
wherein

a driver circuit is provided at only a long side of said one substrate of said pair of substrates.

66. (new) A liquid crystal display apparatus as claimed in claim 48,  
wherein

a threshold voltage of said liquid crystal layer is at most 2 V.

67. (new) A liquid crystal display apparatus as claimed in claim 48,  
wherein  
the active region of said first and second semiconductor elements are made  
of amorphous silicon and polycrystalline silicon; and  
the active region of said semiconductor elements comprising said driver circuit  
is made of single crystalline silicon.

68. (new) A liquid crystal display apparatus according to claim 48, wherein  
another part of said peripheral circuits is arranged in said driver integrated circuit  
region which is not held between said pair of substrates.

69. (new) A liquid crystal display apparatus comprising:  
a pair of substrates, at least one of which is transparent;  
a liquid crystal layer formed by enclosing a liquid crystal composition between  
said pair of substrates;  
a display region, having a plurality of first semiconductor elements which are  
arranged in a matrix is formed on one substrate;  
a peripheral circuits region having a plurality of second semiconductor  
elements for driving said plurality of first semiconductor elements, arranged at a  
periphery of said display region, are formed on said one substrate of said pair of  
substrates;

at least one driver circuit for driving said peripheral circuits bonded at a designated region on said one substrate of said pair of substrates;

wherein said first and second semiconductor elements are thin film transistors; and

the thin film transistors at said display region have a switching time in a range from 30  $\mu\text{s}$  to 60  $\mu\text{s}$ ;

the thin film transistors at said peripheral circuit region have a switching time in a range of 3  $\mu\text{s}$  to 12  $\mu\text{s}$ ; and

said driver circuit has a transistor having a switching time in a range from 0.01  $\mu\text{s}$  to 0.03  $\mu\text{s}$ .